Air Quality Permit

Issued To: Basin Creek Power Services, LLC 65 East Broadway Butte, MT 59701	Permit #3211-02 Application Complete: 03/03/04 Preliminary Determination Issued: 04/02/04 Department Decision Issued: 04/20/04 Permit Final: 05/06/04 AFS Number: 093-0018

An air quality permit, with conditions, is hereby granted to Basin Creek Power Services, LLC (BCP), pursuant to Sections 75-2-204 and 211, Montana Code Annotated (MCA), as amended, and Administrative Rules of Montana (ARM) 17.8.740, *et seq*., as amended, for the following:

Section I: Permitted Facilities

A. Plant Location

BCP is proposing to operate a nominal 54.9-megawatt (MW) electrical power generation facility incorporating nine (6.1 MW per engine) four-stroke, lean-burn, natural gas fired reciprocating internal combustion engines (RICE). The legal description of the site is Section 18, Township 2 North, Range 7 West, in Silver Bow County, Montana.

B. Current Permit Action

On February 24, 2004, BCP submitted a complete permit application for the modification of Montana Air Quality Permit #3211-01. Specifically, the current permit action would allow BCP to replace the three previously permitted RICE (48.3 MW combined capacity) with nine RICE (54.9 MW combined capacity).

Under the current permit action, BCP requested federally enforceable permit conditions to limit the annual potential oxides of nitrogen (NO_x) emissions from the facility to a level less than the New Source Review Prevention of Significant Deterioration (NSR/PSD) permitting threshold of 250 tons per year (tpy) per pollutant. The permit limits the combined RICE operation to 34,600 hours during any rolling 12-month time period and restricts BCP to the use of pipeline quality natural gas. Further, potential NO_x emissions from each RICE are less than 100 tpy. Therefore, the units are classified as low mass emitting (LME) units under the Acid Rain Program (Title IV of the Federal Clean Air Act (FCAA)), thereby eliminating the requirement(s) for compliance with various provisions of the Acid Rain Program (see Section I.D of the permit analysis for additional information). The emission inventory contained in Section IV of the permit analysis demonstrates that the emissions are below the Acid Rain Program LME threshold and below the NSR/PSD permitting threshold.

BCP is proposing an oxidation catalyst (OxiCat - see Section III.B of the permit analysis for a discussion of controls), which controls both carbon monoxide (CO) and volatile organic compound (VOC) emissions. However, the uncontrolled CO emissions are greater than 100 tpy, so ARM Chapter 17.8, Subchapter 15, Compliance Assurance Monitoring (CAM), would apply for the emissions of CO from each RICE (ARM 17.8.15). The uncontrolled VOC emissions are less than 100 tpy, so the CAM rules would not apply to the VOC emissions from the RICE. Also, because lean-burn technology is integral to the design of the proposed RICE, the Department of Environmental Quality (Department) does not consider lean-burn technology to be a control device as defined in ARM 17.8.1501(5). Therefore, the uncontrolled NO_x emissions from the RICE are below 100 tpy and are not subject to CAM.

Section II: Limitations and Conditions

A. Emission Limitations and Control Requirements

1. Emissions from each RICE shall not exceed the following based on a 1-hour average (ARM 17.8.752):

NO_x[1]	14.4 lb/hr
CO	5.10 lb/hr
VOC	2.60 lb/hr

2. BCP shall combust only pipeline quality natural gas for RICE operations (ARM 17.8.752).

3. BCP shall install, operate, and maintain an oxidation catalyst on each RICE (ARM 17.8.752).

4. BCP shall limit the combined RICE operation (9 engines total) to 34,200 hours during any rolling 12-month time period (ARM 17.8.749).

5. BCP shall not cause or authorize emissions to be discharged into the outdoor atmosphere from any sources installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes (ARM 17.8.304).

6. BCP shall not cause or authorize emissions to be discharged into the atmosphere from haul roads, access roads, parking lots, or the general plant property without taking reasonable precautions to control emissions of airborne particulate matter (ARM 17.8.308).

7. BCP shall treat all unpaved portions of the access roads, parking lots, and general plant area with water and/or chemical dust suppressant as necessary to maintain compliance with the reasonable precautions limitation in Section II.A.6 (ARM 17.8.752).

8. BCP shall comply with all applicable standards and limitations, and the reporting, recordkeeping, and notification requirements of the Acid Rain Program contained in 40 CFR 72-78 (40 CFR 72 through 40 CFR 78).

B. Testing Requirements

1. BCP shall test each RICE for NO_x and CO, concurrently, within 180 days of initial start-up of the RICE or according to another testing/monitoring schedule as may be approved by the Department to demonstrate compliance with the NO_x and CO emission limits contained in Section II.A.1. The testing shall continue on an every 2-year basis, or according to another testing/monitoring schedule as may be approved by the Department (ARM 17.8.105 and 17.8.749).

2. All compliance source tests shall be conducted in accordance with the Montana Source Test Protocol and Procedures Manual (ARM 17.8.106).

3. The Department may require additional testing (ARM 17.8.105).

C. Operational Reporting Requirements

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1 NO_x reported as NO_2.

1. BCP shall supply the Department with annual production information for all emission points, as required by the Department in the annual emission inventory request. The request will include, but is not limited to, all sources of emissions identified in Section I of the permit analysis.

   Production information shall be gathered on a calendar-year basis and submitted to the Department by the date required in the emission inventory request. Information shall be in the units required by the Department. This information may be used for calculating operating fees based on actual emissions from the facility, and/or to verify compliance with permit limitations (ARM 17.8.505).

2. BCP shall document, by month, the combined hours of operation of the nine RICE. By the 25th day of each month, BCP shall total the combined hours of operation of the nine RICE to verify compliance with the limit in Section II.A.4. A written report, including the previous 12-month total combined hours of operation for the nine RICE, shall be submitted annually to the Department along with the annual emission inventory (ARM 17.8.749).

3. BCP shall notify the Department of any construction or improvement project conducted pursuant to ARM 17.8.745(1), that would include a change in control equipment, stack height, stack diameter, stack flow, stack gas temperature, source location or fuel specifications, or would result in an increase in source capacity above its permitted operation or the addition of a new emission unit. The notice must be submitted to the Department, in writing, 10 days prior to start up or use of the proposed de minimis change, or as soon as reasonably practicable in the event of an unanticipated circumstance causing the de minimis change, and must include the information requested in ARM 17.8.745(l)(d) (ARM 17.8.745).

4. The records compiled in accordance with this permit shall be maintained by BCP as a permanent business record for at least 5 years following the date of the measurement, shall be submitted to the Department upon request, and shall be available at the plant site for inspection by the Department (ARM 17.8.749).

D. Notification

   BCP shall provide the Department with written notification of the following information within the specified time periods (ARM 17.8.749):

   1. Commencement of construction of the power generation facility within 15 working days after beginning construction.

   2. Actual start-up date of each RICE within 15 working days of the actual start-up of the RICE.

Section III: General Conditions

A. Inspection - The recipient shall allow the Department's representatives access to the source at all reasonable times for the purpose of making inspections or surveys, collecting samples, obtaining data, auditing any monitoring equipment (CEMS, CERMS), or observing any monitoring or testing, and otherwise conducting all necessary functions related to this permit.
B. Waiver - The permit and all the terms, conditions, and matters stated herein shall be deemed accepted if the recipient fails to appeal as indicated below.

C. Compliance with Statutes and Regulations – Nothing in this permit shall be construed as relieving BCP of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq*. (ARM 17.8.756).

D. Enforcement - Violations of limitations, conditions and requirements contained herein may constitute grounds for permit revocation, penalties or other enforcement as specified in Section 75-2-401, *et seq.*, MCA.

E. Appeals - Any person or persons jointly or severally adversely affected by the Department's decision may request, within 15 days after the Department renders its decision, upon affidavit setting forth the grounds therefore, a hearing before the Board of Environmental Review (Board). A hearing shall be held under the provisions of the Montana Administrative Procedures Act. The Department's decision on the application is not final unless 15 days have elapsed and there is no request for a hearing under this section. The filing of a request for a hearing postpones the effective date of the Department's decision until the conclusion of the hearing and issuance of a final decision by the Board.

F. Permit Inspection – As required by ARM 17.8.755, Inspection of Permit, a copy the air quality permit shall be made available for inspection by the Department at the location of the source.

G. Construction Commencement - Construction must begin within 3 years of permit issuance and proceed with due diligence until the project is complete or the permit shall be revoked.

H. Permit Fees - Pursuant to Section 75-2-220, MCA, as amended by the 1991 Legislature, the continuing validity of this permit is conditional upon the payment by the permittee of an annual operation fee, as required, by that section and rules adopted thereunder by the Board.

Permit Analysis
Basin Creek Power Services, LLC
Permit #3211-02

I. Introduction/Process Description

A. Permitted Equipment

Basin Creek Power Services, LLC (BCP), operates a nominal 54.9-megawatt (MW) electrical power generation facility incorporating nine (6.1 MW) four-stroke, lean-burn, natural gas fired reciprocating internal combustion engines (RICE). The legal description of the site is Section 18, Township 2 North, Range 7 West, in Silver Bow County, Montana.

B. Process/Source Description

The RICE produces electrical power by engine shaft rotation of an electric generator. The RICE will combust pipeline quality natural gas and will incorporate an oxidation catalyst (OxiCat) for the control of carbon monoxide (CO), volatile organic compound (VOC), and hazardous air pollutant (HAP) emissions. No add-on control will be incorporated for oxides of nitrogen (NO_x) emissions, as the combustion of pipeline quality natural gas in lean-burn RICE inherently results in low NO_x emissions and the limit of 34,200 combined operating hours per year will also reduce NO_x emissions. Further, the RICE will not incorporate add-on controls for sulfur dioxide (SO_2) and particulate matter less than 10 microns (µm) aerodynamic diameter (PM_{10}) emissions. BCP is required by permit to combust only pipeline quality natural gas, which similar to the previously discussed inherent NO_x control, will result in reduced SO_2 and PM_{10} emissions.

Since the NO_x emissions from each RICE are less than 100 tons per year (tpy) and BCP has requested permit conditions limiting potential facility wide NO_x emissions, the facility is classified as a low mass emitting (LME) unit facility, as defined under the federal Acid Rain Program (Title IV of the Federal Clean Air Act (FCAA)) and a minor source, as defined under the New Source Review Prevention of Significant Deterioration (NSR/PSD) permitting program.

C. Permit History

On November 19, 2002, BCP was issued final Montana Air Quality Permit **#3211-00**. Under the initial permitting action, BCP proposed the construction and operation of four nominal 23.9-MW simple cycle turbines to produce electrical power for the grid. The plant design scenario included two Pratt and Whitney FT8-1 twin pacs with each twin pac consisting of two simple cycle turbines and a single electric generator capable of combusting natural gas or distillate fuel oil #2. The electric generation system was permitted to operate as a “peaking unit” or “load following unit.” Emissions of NO_x from the turbines were required by permit to be controlled with a water injection system that was an integral part of the design of the Pratt and Whitney FT8-1 units. In addition, BCP proposed the installation of a catalyst to control at least 80% of the CO emissions from each twin pack. The equipment permitted in Permit #3211-00 was never installed.

On March 3, 2003, BCP submitted a complete permit application for the replacement of the four previously permitted Pratt and Whitney natural gas fired simple-cycle turbines (95.6 MW combined capacity) with three RICE (48.3 MW combined capacity). Each RICE was equipped with an OxiCat and operated in a dual-fuel mode utilizing pipeline quality natural gas and distillate fuel oil #2. Under this permitting action, BCP requested federally enforceable permit conditions to limit the annual potential NO_x emissions from the facility. Potential NO_x emissions for each RICE were limited to less than 100 tpy to be classified as LME units under the Acid Rain Program. The Department of Environmental Quality (Department) limited BCP's emissions by establishing an operational limit for each RICE of 3,850 hours during any rolling 12-month time period and by limiting the fuel combusted in each RICE. The facility-wide potential NO_x emissions were further limited by a combined RICE operation limit of 9,600 hours during any rolling 12-month period. This limit allowed the BCP facility to remain below the NSR/PSD permitting threshold of 250 tpy. On May 8, 2003, Permit **#3211-01** was issued final. Permit #3211-01 replaced Permit #3211-00. The equipment permitted in Permit #3211-01 was never constructed.

D. Current Permit Action

On February 24, 2004, BCP submitted a complete permit application for the modification of Montana Air Quality Permit #3211-01. Specifically, the current permit action would allow BCP to replace the three previously permitted RICE (48.3 MW combined capacity) with nine RICE (54.9 MW combined capacity).

Under the current permit action, BCP requested federally enforceable permit conditions to limit the annual potential NO_x emissions from the facility to a level less than the NSR/PSD permitting threshold of 250 tpy per pollutant. The permit limits the combined RICE operation to 34,600 hours during any rolling 12-month time period and restricts BCP to the use of pipeline quality natural gas. Further, potential NO_x emissions from each RICE are less than 100 tpy. Therefore, the units are classified as LME under the Acid Rain Program (Title IV of the FCAA), thereby eliminating the requirement(s) for compliance with various provisions of the Acid Rain Program (see Section I.D of the permit analysis for additional information). The emission inventory contained in Section IV of the permit analysis demonstrates that the emissions are below the Acid Rain Program LME threshold and below the NSR/PSD permitting threshold.

BCP is proposing an OxiCat (see Section III.B of the permit analysis for a discussion of controls), which controls both CO and VOC emissions. However, the uncontrolled CO emissions are greater than 100 tpy, so the Administrative Rules of Montana (ARM), Chapter 17.8, Subchapter 15, Compliance Assurance Monitoring (CAM) rules would apply for emissions of CO from each RICE (ARM 17.8.15). The uncontrolled VOC emissions are less than 100 tpy, so the CAM rules would not apply for the VOC emissions from the RICE. Also, because lean-burn technology is integral to the design of the proposed RICE, the Department does not consider lean-burn technology to be a control device as defined in the ARM 17.8.1501(5). Therefore, the uncontrolled NO_x emissions from the RICE are below 100 tpy and are not subject to CAM. Permit **#3211-02** will replace Permit #3211-01.

E. Additional Information

Additional information, such as applicable rules and regulations, Best Available Control Technology (BACT)/Reasonably Available Control Technology (RACT) determinations, air quality impacts, and environmental assessments, is included in the analysis associated with each change to the permit.

II. Applicable Rules and Regulations

The following are partial explanations of some applicable rules and regulations that apply to the facility. The complete rules are stated in the ARM and are available, upon request, from the Department. Upon request, the Department will provide references for location of complete copies of all applicable rules and regulations, or copies, where appropriate.

A. ARM 17.8, Subchapter 1, General Provisions, including, but not limited to:

1. ARM 17.8.101 Definitions. This rule includes a list of applicable definitions used in this subchapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.105 Testing Requirements. Any person or persons responsible for the emissions of any air contaminant into the outdoor atmosphere shall, upon written request of the Department, provide the facilities and necessary equipment (including instruments and sensing devices) and shall conduct tests, emission or ambient, for such periods of time as may be necessary, using methods approved by the Department. Based on the emissions from the RICE, the Department determined that initial testing for NO_x and CO is necessary to demonstrate compliance with applicable emission limits. Furthermore, based on the emissions from the RICE and the current Department testing schedule guidance, the Department determined that additional testing every 2 years is necessary to demonstrate compliance with the NO_x and CO emission limits.

3. ARM 17.8.106 Source Testing Protocol. The requirements of this rule apply to any emission source testing conducted by the Department, any source, or other entity as required by any rule in this chapter, or any permit or order issued pursuant to this chapter, or the provisions of the Clean Air Act of Montana, 75-2-101, *et seq.*, Montana Code Annotated (MCA).

   BCP shall comply with the requirements contained in the Montana Source Test Protocol and Procedures Manual including, but not limited to, using the proper test methods and supplying the required reports. A copy of the Montana Source Test Protocol and Procedures Manual is available from the Department upon request.

4. ARM 17.8.110 Malfunctions. (2) The Department must be notified promptly, by telephone, whenever a malfunction occurs that can be expected to create emissions in excess of any applicable emission limitation, or to continue for a period greater than 4 hours.

5. ARM 17.8.111 Circumvention. (1) No person shall cause or permit the installation or use of any device or any means that, without resulting in reduction in the total amount of air contaminant emitted, conceals or dilutes an emission of air contaminant that would otherwise violate an air pollution control regulation. (2) No equipment that may produce emissions shall be operated or maintained in such a manner that a public nuisance is created.

B. ARM 17.8, Subchapter 2, Ambient Air Quality, including, but not limited to:

1. ARM 17.8.210 Ambient Air Quality Standards for Sulfur Dioxide
2. ARM 17.8.211 Ambient Air Quality Standards for Nitrogen Dioxide
3. ARM 17.8.212 Ambient Air Quality Standards for Carbon Monoxide
4. ARM 17.8.213 Ambient Air Quality Standard for Ozone

5. ARM 17.8.220 Ambient Air Quality Standard for Settled Particulate Matter
6. ARM 17.8.221 Ambient Air Quality Standard for Visibility
7. ARM 17.8.223 Ambient Air Quality Standard for PM_{10}

BCP must maintain compliance with the applicable ambient air quality standards.

C. ARM 17.8, Subchapter 3, Emission Standards, including, but not limited to:

1. ARM 17.8.304 Visible Air Contaminants. This rule requires that no person may cause or authorize emissions to be discharged into an outdoor atmosphere from any source installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes.

2. ARM 17.8.308 Particulate Matter, Airborne. (1) This rule requires an opacity limitation of less than 20% for all fugitive emission sources and that reasonable precaution be taken to control emissions of airborne particulate. (2) Under this rule, BCP shall not cause or authorize the use of any street, road, or parking lot without taking reasonable precautions to control emissions of airborne particulate matter.

3. ARM 17.8.340 Standard of Performance for New Stationary Sources. This rule incorporates, by reference, 40 CFR Part 60, Standards of Performance for New Stationary Sources (NSPS). BCP's RICE units are not considered NSPS affected facilities under 40 CFR Part 60 because the units do not meet the definition of an affected unit under any subpart contained in 40 CFR 60.

4. ARM 17.8.341 Emission Standards for Hazardous Air Pollutants. This rule incorporates, by reference, 40 CFR Part 61, National Emission Standards for Hazardous Air Pollutants (NESHAP). Since HAP emissions from the BCP power generation facility are less than 10 tons per year for any individual HAP and less than 25 tons per year for all HAPs combined, the BCP facility is not subject to the provisions of 40 CFR Part 61.

5. ARM 17.8.342 Emission Standards for Hazardous Air Pollutants for Source Categories. This rule incorporates, by reference, 40 CFR Part 63, NESHAP for Source Categories. Since HAP emissions from the BCP power generation facility are less than 10 tons per year for any individual HAP and less than 25 tons per year for all HAPs combined, the BCP facility is not subject to the provisions of 40 CFR Part 63.

D. ARM 17.8, Subchapter 5, Air Quality Permit Application, Operation and Open Burning Fees, including, but not limited to:

1. ARM 17.8.504 Air Quality Permit Application Fees. This rule requires that an applicant submit an air quality permit application fee concurrent with the submittal of an air quality permit application. A permit application is incomplete until the proper application fee is paid to the Department. BCP submitted the appropriate permit application fee for the current permit action.

2. ARM 17.8.505 Air Quality Operation Fees. An annual air quality operation fee must, as a condition of continued operation, be submitted to the Department by each source of air contaminants holding an air quality permit, excluding an open burning permit, issued by the Department; and the air quality operation fee is based on the actual, or estimated actual, amount of air pollutants emitted during the previous calendar year.
An air quality operation fee is separate and distinct from an air quality permit application

fee. The annual assessment and collection of the air quality operation fee, described above, shall take place on a calendar-year basis. The Department may insert into any final permit issued after the effective date of these rules, such conditions as may be necessary to require the payment of an air quality operation fee on a calendar-year basis, including provisions that pro-rate the required fee amount.

E. ARM 17.8, Subchapter 7, Permit, Construction and Operation of Air Contaminant Sources, including, but not limited to:

1. ARM 17.8.740 Definitions. This rule is a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.743 Montana Air Quality Permits--When Required. This rule requires a person to obtain an air quality permit or permit modification to construct, alter or use any air contaminant sources that have the Potential to Emit (PTE) greater than 25 tons per year of any pollutant. BCP has a PTE greater than 25 tons per year of NO_x, CO, and VOC; therefore, an air quality permit is required.

3. ARM 17.8.744 Montana Air Quality Permits--General Exclusions. This rule identifies the activities that are not subject to the Montana Air Quality Permit program.

4. ARM 17.8.745 Montana Air Quality Permits—Exclusion for De Minimis Changes. This rule identifies the de minimis changes at permitted facilities that are not subject to the Montana Air Quality Permit Program.

5. ARM 17.8.748 New or Modified Emitting Units--Permit Application Requirements. (1) This rule requires that a permit application be submitted prior to installation, alteration, or use of a source. BCP submitted the required permit application for the current permit action. (7) This rule requires that the applicant notify the public by means of legal publication in a newspaper of general circulation in the area affected by the application for a permit. BCP submitted an affidavit of publication of public notice for the February 27, 2004, issue of *The Montana Standard*, a newspaper of general circulation in the Town of Butte in Silver Bow County, Montana, as proof of compliance with the public notice requirements.

6. ARM 17.8.749 Conditions for Issuance or Denial of Permit. This rule requires that the permits issued by the Department must authorize the construction and operation of the facility or emitting unit subject to the conditions in the permit and the requirements of this subchapter. This rule also requires that the permit must contain any conditions necessary to assure compliance with the Federal Clean Air Act (FCAA), the Clean Air Act of Montana, and rules adopted under those acts.

7. ARM 17.8.752 Emission Control Requirements. This rule requires a source to install the maximum air pollution control capability that is technically practicable and economically feasible, except that BACT shall be utilized. A BACT analysis was conducted for sources of NO_x, CO, VOC, SO_2, particulate matter, and PM_{10} at this facility. The BACT analysis is described in Section IV of this permit analysis.

8. ARM 17.8.755 Inspection of Permit. This rule requires that air quality permits shall be made available for inspection by the Department at the location of the source.
9. ARM 17.8.756 Compliance with Other Requirements. This rule states that nothing in the permit shall be construed as relieving BCP of the responsibility for complying with any

applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq*.

10. ARM 17.8.759 Review of Permit Applications. This rule describes the Department's responsibilities for processing permit applications and making permit decisions on those permit applications that do not require the preparation of an environmental impact statement.

11. ARM 17.8.762 Duration of Permit. An air quality permit shall be valid until revoked or modified, as provided in this subchapter, except that a permit issued prior to construction of a new or altered source may contain a condition providing that the permit will expire unless construction is commenced within the time specified in the permit, which in no event may be less than 1 year after the permit is issued.

12. ARM 17.8.763 Revocation of Permit. An air quality permit may be revoked upon written request of the permittee, or for violations of any requirement of the Clean Air Act of Montana, rules adopted under the Clean Air Act of Montana, the FCAA, rules adopted under the FCAA, or any applicable requirement contained in the Montana State Implementation Plan (SIP).

13. ARM 17.8.764 Administrative Amendment to Permit. An air quality permit may be amended for changes in any applicable rules and standards adopted by the Board of Environmental Review (Board) or changed conditions of operation at a source or stack that do not result in an increase of emissions as a result of those changed conditions. The owner or operator of a facility may not increase the facility's emissions beyond permit limits unless the increase meets the criteria in ARM 17.8.745 for a de minimis change not requiring a permit, or unless the owner or operator applies for and receives another permit in accordance with ARM 17.8.748, ARM 17.8.749, ARM 17.8.752, ARM 17.8.755, and ARM 17.8.756, and with all applicable requirements in ARM Title 17, Chapter 8, Subchapters 8, 9, and 10.

14. ARM 17.8.765 Transfer of Permit. This rule states that an air quality permit may be transferred from one person to another if written notice of Intent to Transfer, including the names of the transferor and the transferee, is sent to the Department.

F. ARM 17.8, Subchapter 8, Prevention of Significant Deterioration of Air Quality, including, but not limited to:

1. ARM 17.8.801 Definitions. This rule is a list of applicable definitions used in this subchapter.

2. ARM 17.8.818 Review of Major Stationary Sources and Major Modifications--Source Applicability and Exemptions. The requirements contained in ARM 17.8.819 through ARM 17.8.827 shall apply to any major stationary source and any major modification, with respect to each pollutant subject to regulation under the FCAA that it would emit, except as this subchapter would otherwise allow.

The BCP facility is not a listed source and the facility's permitted potential emissions will be less than 250 tons per year for any pollutant. BCP requested a limit to keep the potential NO_x emissions from this facility below the NSR/PSD thresholds for a non-listed source. In accordance with this request, the Department added limits to Permit #3211-02 to keep the potential NO_x emissions below 250 tons per rolling 12-month time period.

G. ARM 17.8, Subchapter 12 - Operating Permit Program Applicability, including, but not limited to:

1. ARM 17.8.1201 Definitions. (23) Major Source under Section 7412 of the FCAA is defined as any stationary source having:

   a. PTE > 100 tons/year of any pollutant;

   b. PTE > 10 tons/year of any one HAP, or PTE > 25 tons/year of a combination of all HAPs, or lesser quantity as the Department may establish by rule; or

   c. PTE > 70 tons/year of PM_{10} in a serious PM_{10} nonattainment area.

2. ARM 17.8.1204 Air Quality Operating Permit Program Applicability. Title V of the FCAA Amendments of 1990 requires that all sources, as defined in ARM 17.8.1204(1), obtain a Title V Operating Permit. In reviewing and issuing Air Quality Permit #3211-02 for BCP, the following conclusions were made:

   a. The facility's PTE is greater than 100 tons/year for NO_x.

   b. The facility's PTE is less than 10 tons/year of any one HAP and less than 25 tons/year of all HAPs.

   c. This facility is not located in a serious PM_{10} nonattainment area. BCP is not a major source for PM_{10} and the requirements contained in ARM 17.8.901 *et seq.* do not apply to the BCP facility. Further, the modeling analysis shows that PM_{10} impacts from the BCP facility comply with the Butte/Silver Bow State Implementation Plan.

   d. This facility is not subject to a current NSPS standard.

   e. This facility is not subject to any current NESHAP standards.

   f. This facility is a Title IV affected source. Permit #3211-02 includes conditions to keep NO_x emissions at a level that qualifies BCP as a LME, thereby allowing exemptions from certain provisions of the Title IV Acid Rain Program.

   g. This facility is not an EPA designated Title V source.

   Based on the above information, the BCP facility is a major source, and a Title V Operating Permit is required. In accordance with ARM 17.8.1205(c)(i), BCP submitted the required Title V operating permit application concurrently with the current Montana Air Quality Permit Application #3211-02.

III. BACT Determination

A BACT determination is required for each new or altered source. BCP shall install on the new or altered source the maximum air pollution control capability that is technically practicable and economically feasible, except that the BACT shall be utilized. A BACT determination is required for every new or modified source. The BACT analysis addresses the available methods for controlling NO_x, CO, PM, PM_{10}, SO_2, and VOC emissions resulting from the operation of the proposed RICE at the facility. The Department reviewed previous BACT determinations for similar sources before making the following BACT determinations.

A. NO_x BACT

NO_x will be formed during the combustion of natural gas in the lean-burn RICE. NO_x formation occurs by three fundamentally different mechanisms. The principal mechanism of NO_x in natural gas combustion is thermal NO_x. The thermal NO_x mechanism occurs through the thermal dissociation and the subsequent reaction of nitrogen (N_2) and oxygen (O_2) molecules in the combustion air. Most NO_x formed through the thermal NO_x mechanism occurs in the high temperature flame zone near the burners. The formation of thermal NO_x is affected by three factors: (1) oxygen concentration, (2) peak temperature, and (3) time of exposure at peak temperature. As these three factors increase, NO_x emission levels increase.

The second mechanism of NO_x formation, called prompt NO_x, occurs through early reaction of nitrogen molecules in the combustion air and hydrocarbon radicals from the fuel. Prompt NO_x reactions occur within the flame and are usually negligible when compared to the amount of NO_x formed through the thermal NO_x mechanism. However, prompt NO_x levels may become significant with the use of ultra-low-NO_x burners.

The third mechanism of NO_x formation, called fuel NO_x, stems from the evolution and reaction of fuel-bound nitrogen compounds with oxygen. Due to the characteristically low fuel nitrogen content of natural gas, NO_x formation through the fuel NO_x mechanism for boilers fired with natural gas is insignificant. Natural gas, by permit, accounts for 100% of the total fuel combusted to operate the RICE.

NO_x Control Technology Identification

NO_x emissions from the lean-burn RICE can be reduced by several different methods. The following NO_x control technologies were analyzed for application to the lean-burn RICE at the proposed BCP facility. These control technologies can be applied individually or in combination.

- Selective Catalytic Reduction (SCR)
- Low Temperature Oxidation ($Lott_o$)
- Low Emission Combustion (LEC)
- Wet Controls
- Selective Non-Catalytic Reduction (SNCR)
- Ignition Timing Retard (ITR)
- Innovative Catalytic Systems (SCONOX and XONON)
- Non-Selective Catalytic Reduction (NSCR)
- No-Additional Controls

The following text provides an explanation and analysis of each control technology/strategy listed above.

1. SCR

SCR is a post-combustion gas treatment technique for the reduction of nitric oxide (NO) and nitrogen dioxide (NO_2) in the engine exhaust stream to molecular nitrogen (N), water

(H_2O), and oxygen (O_2). In the SCR process, aqueous or anhydrous ammonia (NH_3) or urea is used as a reducing agent, and is injected into the flue gas upstream of the catalyst bed. NO_x and NH_3 combine at the catalyst surface, forming an ammonium salt intermediate that subsequently decomposes to produce elemental nitrogen and water. SCR is applicable to lean-burn engines with greater than 1% exhaust O_2, because O_2 in the exhaust is the reagent used in the selective reduction reaction. The basic chemical reactions are:

$$4NH_3 + 4NO + O_2 \rightarrow 4N_2 + 6H_2O$$
$$8NH_3 + 6NO_2 \rightarrow 7N_2 + 12H_2O$$
$$2NO_2 + 4NH_3 + O_2 \rightarrow 3N_2 + 6H_2O$$

Catalysts lower the temperature required for the chemical reaction between NO_x and ammonia. Catalysts used for NO_x reduction can include base metals, precious metals, and zeolites. Commonly, the catalyst is a mixture of titanium and vanadium oxides. SCR works best for flue gas temperatures between 575°F and 800°F. Below 575^0F the NO_x reduction reaction will not proceed. Operation above 800°F will shorten catalyst life and can lead to the oxidation of ammonia to either nitrogen oxides (thereby actually increasing the NOx emissions) or to explosive levels of ammonium nitrate.

Technical factors that impact the effectiveness of this technology include the catalyst reactor design, operating temperature, type of fuel fired, sulfur content of the fuel, design of the ammonia injection system, and the potential for catalyst poisoning.

The control efficiency for an SCR applied to lean-burn RICE is said to range from 80 to 90%, but actual effectiveness would depend on fuel quality and engine load fluctuations. Further, the cost associated with installing and operating SCR units on the proposed RICE would equal $7,770 per ton of NO_x removed, which is above industry norms.

2. Low Temperature Oxidation ($LoTO_x$)

   With the $LoTO_x$ control alternative, oxygen and nitrogen are injected at approximately 380°F to transform NO and NO_2 into N_2O_5 using an ozone generator and a reactor duct. N_2O_5, that is soluble, dissociates in a wet scrubber into nitrogen and water. This system requires oxygen, nitrogen, a cooling water supply, and treatment for the effluent. The estimated control efficiency for the system is 80% to 90%. However, the $LoTO_x$ control technology has only been demonstrated to work in practice on coal-fired boilers, so there are questions about the applicability of this technology to lean-burn RICE.

3. LEC (No Additional Controls)

   As proposed, the RICE at the BCP facility will use a fuel-lean combustion mixture. Lean-burn combustion is an effective means of achieving LEC. Under lean-burn conditions, NO_x emissions, as well as CO and other hydrocarbon emissions, are drastically reduced.

   The implementation of LEC requires considerable engine modification including the relocation of pistons, cylinder heads, the ignition system, and the intake manifold. While small cylinder designs that promote air-fuel mixing are available, pre-combustion chambers must be installed on larger engines. These pre-combustion chambers have 5-10% of the cylinder volume and allow ignition of a fuel rich mixture that ignites the lean mixture in the cylinder.

LEC commonly limits NO_x emissions to 1 to 2 grams per brake horsepower hour (g/bhp-hr), which is a decrease of 60-80%. In addition, LEC may reduce exhaust opacity. LEC will be an integral part of the design for the proposed Caterpillar RICE. NO_x emissions at 100% load will be below 0.8 g/bhp-hr.

4. Wet Controls

Water or steam injection technology can suppress NO_x emissions from RICE. The injected fluid increases the thermal mass by dilution and thereby reduces peak temperatures in the flame zone. NO_x reduction efficiency increases as the water-to-fuel ratio increases. For maximum efficiency, the water must be atomized and injected with homogeneous mixing throughout the combustor. This technique reduces the thermal NO_x, but may actually increase the production of fuel NO_x. Both CO and VOC emissions may also increase while using water injection. Depending on the initial NO_x concentrations, wet injection may reduce the thermal NO_x by 60% or more.

5. SNCR

The use of SNCR technology is based on the non-catalytic decomposition of NO_x in the flue gas to nitrogen and water using a reducing agent (e.g., ammonia or urea). The reactions take place at much higher temperatures than in an SCR, typically between 1650°F and 2200°F. The exit gas temperature for the proposed RICE is 689°F. Therefore, the use of SNCR would require additional heating of the gas stream. Consequently, additional heating of the gas stream would result in the emission of additional pollutants and would increase the cost per ton of reduction of air emissions. Further, the estimated control efficiency of SNCR is only 40-60%.

6. ITR

ITR lowers NO_x emissions by moving the ignition event to a point later in the power stroke, where the piston has begun to move downward. Because the combustion chamber volume is not at it's minimum, the peak flame temperature will be reduced, thus reducing thermal NO_x formation. ITR is applicable to all engines. It is implemented in spark ignition engines by changing the timing of the spark, and in compression ignition engines by changing the timing of the fuel injection. Timing adjustments are fairly straightforward; however, replacement of the ignition system with an electronic ignition control or injection timing system will provide better performance with varying engine load and conditions.

Emission reductions attainable using ITR are highly variable, depending on the engine design and operating conditions, and particularly on the air-to-fuel ratio. NO_x reductions are also limited by the extent to which ignition may be delayed in that excess ITR may result in engine misfire. ITR also generally results in the undesirable effect of decreased fuel efficiency and subsequently increased fuel use and the associated increase in emissions from the increased fuel combustion. Further, ITR results in increased exhaust temperatures, which often can lead to reduced exhaust valve and turbocharger life. Typical ITR NO_x reduction ranges from 0-40%.

7. Innovative Catalytic Systems

Innovative catalytic technologies such as SCONOX and XONON integrate catalytic oxidation and absorption technology. In the SCONOX process, CO and NO are catalytically oxidized to CO_2 and NO_x; the NO_2 molecules are subsequently absorbed on the treated surface of the SCONOX catalyst. SCONOX technology is not normally applicable for lean-burn RICE since steam is required in the process. HAPs may increase from the SCONOX technology.

The XONON system is applicable to diffusion and lean-premix combustors. XONON utilizes a flameless combustion system where fuel and air react on a catalyst surface, preventing the formation of NO_x while achieving low CO levels. The overall combustion system consists of the partial combustion of the fuel in the catalyst module followed by completion of combustion downstream of the catalyst. Initial partial-combustion produces no NO_x and downstream combustion occurs in a flameless homogeneous reaction that produces almost no NO_x. The system is totally contained within the combustor and is not an add-on process.

Traditionally SCONOX and XONON technology has not been applied to RICE. Therefore, there are substantial questions surrounding the effectiveness of this control technology when applied to RICE and the cost associated with the implementation.

8. NSCR

NSCR uses a three-way catalyst to promote the decomposition of NO_x to nitrogen and water. Exhaust CO and hydrocarbons are simultaneously oxidized to carbon dioxide (CO_2) and water in this process. NSCR requires low excess oxygen for the catalyst to function. NSCR is only applicable to fuel-rich burning engines with exhaust O_2 concentrations less than 1%. Furthermore, lean-burn engines contain insufficient CO and hydrocarbon for the reduction of the NO_x present.

9. No Additional Controls (LEC)

This practice would consist of operating the proposed RICE without any add-on pollution control equipment. Since the proposed RICE incorporate lean-burn technology, no additional controls is equivalent to LEC (see Section III.A.3 of the permit analysis). No additional controls/LEC is capable of achieving NO_x emission reductions of 60-80%.

NO_x BACT Summary and Determination

In making a BACT determination, the Department analyzed the use of SCR, $LoTO_x$, LEC (lean-burn technology/no additional controls), Wet Controls, SNCR, ITR, Innovative Catalytic Systems, and NSCR control strategies for the RICE at the proposed BCP facility. Due to the various technical and economic feasibility factors associated with SCR, $LoTo_x$, Wet Controls, SNCR, ITR, Innovative Catalytic Systems, and NSCR as previously discussed, the Department determined that the use of LEC and an emission limit of 14.4 lb/hr will constitute BACT for NO_x emissions.

B. CO BACT

This BACT analysis considers the use of catalytic and thermal oxidizers and proper design utilizing good combustion practices for the control of CO emissions from the proposed lean-burn RICE at the BCP facility. Oxidation of CO in post combustion gases may be accomplished through thermal oxidation with or without the assistance of a catalyst. The efficiency of these CO control technologies is typically between 70 and 90% effective.

CO Control Technology Identification

- Thermal Oxidation
- Catalytic Oxidation
- No Additional Controls

The following text provides an explanation and analysis of each control technology/strategy listed above.

1. Thermal Oxidation

   Thermal oxidizers or incinerators use heat to destroy CO in the gas stream. Incineration is an oxidation process that ideally breaks down the molecular structure of an organic compound into carbon dioxide and water vapor. Temperature, residence time, and turbulence of the system affect CO control efficiency. CO control efficiency for a thermal oxidation system is typically 70-90%. A thermal oxidizer/incinerator generally operates at temperatures between 1450°F and 1600°F. Therefore, exhaust stream re-heat would be required for the proposed RICE application.

2. Catalytic oxidation/incineration is similar to thermal oxidation/incineration; however, catalytic incineration allows for oxidation at temperatures ranging from 600°F to 1000°F. The catalyst systems that are used are typically metal oxides such as nickel oxide, copper oxide, manganese dioxide, or chromium oxide. Noble metals such as platinum and palladium may also be used. These catalyst systems oxidize CO to CO_2 at efficiencies of 70-90%. Because the catalytic reaction happens at a decreased temperature (600-1000ºF), exhaust stream re-heat would not be required for this application, which would make catalytic oxidation more economical for the proposed RICE application.

3. No Additional Controls

   This practice would consist of operating the proposed RICE without any add-on pollution control equipment. The lean-burn engine uses a pre-combustion chamber to enclose a rich mixture of air and fuel; the mixture is then ignited in this chamber. The resulting ignition front fires into the larger main cylinder that contains a much leaner fuel mixture. Staging the combustion and burning a leaner fuel mixture results in lowering of peak flame temperatures. Lower combustion temperature assures lower NO_x concentration in the exhaust gas stream; however, excess air in the fuel to air mixture can result in increased CO emissions. CO emissions from a lean-burn engine with no additional controls are much higher than the CO emissions from a lean-burn engine with additional controls.

CO BACT Summary and Determination

While no additional controls would have no energy or economic impacts on BCP, no additional controls would have negative impacts on air quality. Therefore, the Department determined that oxidation of post-combustion gases using a catalyst (OxiCat) is capable of significant CO reduction, is technically feasible, and is economically feasible for the proposed RICE. Therefore, the Department determined that the use of an OxiCat and an emission limit of 5.10 lb/hr will constitute BACT for CO emissions.

C. Particulate Matter/PM_{10} BACT

PM and PM_{10} are formed during the combustion of fossil fuels in the RICE. The concentration of PM and PM_{10} can be reduced by using various control technologies. The following control technologies/strategies were analyzed through the BACT process for application to the RICE.

PM/PM_{10} Control Technology Identification

- Cyclone
- Electrostatic Precipitators (ESP)
- Fabric Filters (baghouses)
- Wet Scrubbers
- No Additional Controls: Low Ash Fuel Combustion

The following text provides an explanation and analysis of each control technology listed above.

1. Cyclone

Cyclones use inertia to remove particles from the gas stream. The cyclone imparts centrifugal force on the gas stream, usually within a conical shaped chamber. Cyclones operate by creating a double vortex inside the cyclone body. The incoming gas is forced into circular motion down the cyclone near the inner surface of the cyclone tube. At the bottom of the cyclone, the gas turns and spirals up through the center of the tube and out of the top of the cyclone. Particles in the gas stream are forced toward the cyclone walls by the centrifugal force of the spinning gas but are opposed by the fluid drag force of the gas traveling through and out of the cyclone. For large particles, inertial momentum overcomes the fluid drag force so that the particles reach the cyclone walls and are collected. For small particles, the fluid drag force overwhelms the inertial momentum and causes these particles to leave the cyclone with the exiting gas.

Traditionally, cyclones have not been applied to RICE operations. Cyclone collection efficiency can range from 30-90% for PM/PM_{10} emissions. The cost associated with installing and operating cyclone units on the proposed RICE would be approximately $125,400 per ton of PM/$PM_{10}$ removed, which is well above industry norms. Further, RACT/BACT/LEAR Clearinghouse (RBLC) has no listing of a lean-burn RICE that has been required to apply add-on controls for PM/$PM_{10.}$

2. ESP

An ESP uses electric forces to remove particles from a gas stream and onto collection plates. Particles are given an electric charge by forcing them to pass through the corona that surrounds a highly charged electrode. An electrical field then forces the charged particles to the opposite charged electrode, usually a plate. Solid particles are removed from the collection electrode by a shaking process known as “rapping.” Advantages of an ESP include very high collection efficiencies and can include the ability to treat relatively large gas volumes, while disadvantages include high capital cost, lack of operational flexibility, and overall size of the equipment. The control cost effectiveness for ESP technology was determined to be approximately $186,700 per ton of PM/$PM_{10}$ removed, which is well above industry norms and makes ESP technology economically infeasible. For these reasons, an ESP does not constitute BACT for control of particulate emissions from the RICE.

3. Fabric Filter (Baghouse)

Baghouses consist of one or more isolated compartments containing rows of fabric filter bags or tubes. The gas stream passes through the fabric filter, where particulate is retained on the upstream face of the bags, while the cleaned gas stream is vented to the atmosphere or to another pollution control device. Bags can be obtained that are capable of handling high temperature gas; however, the cost effectiveness of installing a baghouse with the appropriate bags is cost prohibitive and well above industry norms at approximately $323,600 per ton of PM/PM_{10} removed. For these reasons, a baghouse does not constitute BACT for control of particulate emissions from the RICE.

4. Wet Scrubber

Wet scrubbers typically use water to impact, intercept, or diffuse a particulate-laden gas stream. With impaction, particulate matter is accelerated and impacted onto a surface area or into a liquid droplet through devices such as venturis and spray chambers. Using interception, particles flow nearly parallel to the water droplets that allow the water to intercept the particles. Diffusion is used for particles smaller than 0.5 microns and where there is a high temperature difference between the gas and the scrubbing liquid.

Using a wet scrubber would result in additional environmental and energy concerns, for example, the large volume of wastewater and high energy cost that would result from the process. In addition, the cost effectiveness of this technology was determined to be approximately $582,300 per ton of PM/PM_{10} removed, making wet scrubber application economically infeasible. For these reasons, a wet scrubber does not constitute BACT for particulate emissions from the RICE.

5. No Additional Controls: Low Ash Fuel Combustion

This practice would consist of operating the proposed RICE without any add-on pollution control equipment. The proposed lean-burn RICE operated on a low ash fuel, such as pipeline quality natural gas, have relatively low particulate emissions compared with other fuels used in the power generation industry.

PM/PM_{10} BACT Summary and Determination

The proposed RICE operation has relatively low particulate emissions. The application of control technology would be economically unreasonable. Therefore, the Department determined that no additional controls would constitute BACT for the proposed RICE.

D. SO_2 BACT

The proposed RICE engines are required by permit to be operated with pipeline quality natural gas. Pipeline quality natural gas has an inherently low sulfur content and subsequently low SO_2 emissions associated with combustion of the gas. Therefore, the Department determined that any add-on SO_2 controls would likely not result in a significant reduction of the already low potential SO_2 emissions. BACT for the proposed RICE consists of combustion of pipeline quality natural gas and no additional controls.

E. VOC BACT

The proposed RICE produce inherently low VOC emissions. In addition, Section III.B of the permit analysis requires the operation of an OxiCat to control CO emission, which also controls VOC emissions by approximately 65%. Therefore, the Department determined that the BCP proposed emission factor of 0.14 grams per brake horsepower hour (g/bhp-hr), which corresponds to an emission limit of 2.60 lb/hr would constitute BACT.

The control options selected as part of this review have controls and control costs that are comparable to other recently permitted similar sources. The control options that were selected are capable of achieving the appropriate emission standards.

IV. Emission Inventory

RICE Emission Inventory: Worst Case Controlled Emissions (tons/year)					
Source	**PM/PM_{10}**	**NO_x**	**CO**	**VOC**	**SO_x**
Combined RICE Emissions (9 RICE: 34,200 hrs)	18.8	246.2	87.2	44.5	0.51
Pre-Heater Emissions (9 heaters)	0.1	1.1	0.9	0.1	0.01
Furnace Heater Emissions (9 heaters)	0.1	0.9	0.7	0.05	0.00
Facility-Wide Emissions	20.0	248.2	88.8	44.6	0.5

RICE Emission Inventory

Individual RICE Operating Hours: 8,760 hr/yr
Combined RICE Operating Hours: 34,200 hr/yr (Permit Limit)

PM/PM_{10} Emissions:
Emission Factor: 1.1 lb/hr/RICE (Manufacturers Information)
Individual Calculation: 1.1 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 4.8 ton/yr
Combined Calculation: 1.1 lb/hr * 34,200 hr/yr * 0.0005 ton/lb = 18.8 ton/yr

NO_x Emissions:
Emission Factor: 14.4 lb/hr/RICE (BACT)
Individual Calculation: 14.4 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 63.1 ton/yr
Combined Calculation: 14.4 lb/hr * 34,200 hr/yr * 0.0005 ton/lb = 246.2 ton/yr

CO Emissions:
Emission Factor: 5.1 lb/hr/RICE (BACT)
Individual Calculation: 5.1 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 22.3 ton/yr
Combined Calculation: 5.1 lb/hr * 34,200 hr/yr * 0.0005 ton/lb = 87.2 ton/yr

VOC Emissions:
Emission Factor: 2.6 lb/hr/RICE (BACT)
Individual Calculation: 2.6 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 11.4 ton/yr
Combined Calculation: 2.6 lb/hr * 34,200 hr/yr * 0.0005 ton/lb = 44.5 ton/yr

SO_x Emissions:
Emission Factor: 0.03 lb/hr/RICE (Manufacturers Worst-Case Information)
Individual Calculation: 0.03 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.13 ton/yr
Combined Calculation: 0.03 lb/hr * 34,200 hr/yr * 0.0005 ton/lb = 0.51 ton/yr

Pre-Heater Emission Inventory

Maximum Fuel Combustion Rate: 2.5 MMBtu/hr-unit
Fuel Heating Value: 1.020 MMBtu/MMscf
Number of Units: 9
Hours of Operation (9 heaters): 9,000 hrs/yr
Fuel Usage: [2.5 MMBtu/hr-unit)/(1,020 MMBtu/MMscf)] * 9,000 hrs/yr = 22.0 MMscf/yr

PM/PM_{10} Emissions:
Emission Factor: 7.6 lb/MMscf (FIRE 6.23)
Calculation: 7.6 lb/MMscr * 22.0 MMscf/yr * 0.0005 ton/lb = 0.08 ton/yr

NO_x Emissions:
Emission Factor: 100 lb/MMscf (FIRE 6.23)
Calculation: 100 lb/MMscr * 22.0 MMscf/yr * 0.0005 ton/lb = 1.1 ton/yr

CO Emissions:
Emission Factor: 84 lb/MMscf (FIRE 6.23)
Calculation: 84 lb/MMscf * 22.0 MMscf/yr * 0.0005 ton/lb = 0.92 ton/yr

VOC Emissions:
Emission Factor: 5.5 lb/MMscf (FIRE 6.23)
Calculation: 5.5 lb/MMscf * 22.0 MMscf/yr * 0.0005 ton/lb = 0.06 ton/yr

SO_x Emissions:
Emission Factor: 0.6 lb/MMscf (FIRE 6.23)
Calculation: 0.6 lb/MMscf * 22.0 MMscf/yr * 0.0005 ton/lb = 0.007 ton/yr

Furnace Heater Emission Inventory

Maximum Fuel Combustion Rate: 2.0 MMBtu/hr-unit
Fuel Heating Value: 1.020 MMBtu/MMscf
Number of Units: 9
Hours of Operation (9 heaters): 9,000 hr/yr
Fuel Usage: [2.0 MMBtu/hr-unit)/(1,020 MMBtu/MMscf)] * 9,000 hrs/yr = 17.6 MMscf/yr

PM/PM_{10} Emissions:
Emission Factor: 7.6 lb/MMscf (FIRE 6.23)
Calculation: 7.6 lb/MMscr * 17.6 MMscf/yr * 0.0005 ton/lb = 0.07 ton/yr

NO_x Emissions:
Emission Factor: 100 lb/MMscf (FIRE 6.23)
Calculation: 100 lb/MMscr * 17.6 MMscf/yr * 0.0005 ton/lb = 0.88 ton/yr

CO Emissions:
Emission Factor: 84 lb/MMscf (FIRE 6.23)
Calculation: 84 lb/MMscf * 17.6 MMscf/yr * 0.0005 ton/lb = 0.74 ton/yr

VOC Emissions:
Emission Factor: 5.5 lb/MMscf (FIRE 6.23)
Calculation: 5.5 lb/MMscf * 17.6 MMscf/yr * 0.0005 ton/lb = 0.05 ton/yr

SO_x Emissions:
Emission Factor: 0.6 lb/MMscf (FIRE 6.23)
Calculation: 0.6 lb/MMscf * 17.6 MMscf/yr * 0.0005 ton/lb = 0.005 ton/yr

V. Ambient Air Quality Impacts

The facility will be located approximately 2 miles south of the Bert Mooney Airport and approximately 0.75 mile west of Harrison Avenue in the Butte, Montana, Industrial Park. The total property area is approximately 20 acres with the facility comprising approximately 10 acres. The property lies in the northwest ¼ of the northwest ¼ of Section 18, Township 2 North, Range 7 West, in Silver Bow County. The facility lies on a relatively flat plain at an elevation of approximately 5,641 feet with mountain ranges approximately 3 miles to the east, south, and west and lower hills, including buttes, to the north and northwest of the proposed location.

The air quality classification of the immediate area is "Nonattainment for PM_{10}" (40 CFR 81.327) and attainment for all other criteria pollutants. The closest PSD Class I area is the Anaconda-Pintler Wilderness, which is located approximately 50 miles west of the facility.

BCP is proposing an annual NO_x limit. A federally enforceable permit condition keeps the combined NO_x emissions below 250 tpy of NO_x, to avoid the NSR permitting program. The proposed permit condition limits the total combined hours of operation for the nine RICE to 34,200 hours during any rolling 12-month time period. The annual emission rates are calculated with a maximum NO_x emission rate of 14.4 lb/hr per engine and by applying the appropriate hours of operation.

The maximum estimated emissions from the facility are approximately 248.2 tpy of NO_x, 88.8 tpy of CO, 20.0 tpy of PM_{10}, 44.6 tpy of VOCs, and 0.5 tpy of SO_2. The pollution control devices proposed for each engine are catalytic oxidizers for control of CO and VOC emissions and lean-burn technology for the control of NO_x emissions. There is no add-on controls proposed for PM_{10} and SO_2 emissions since BACT did not drive control requirements (see Section IV, BACT Analysis, of the permit analysis to this permit for a detailed discussion of controls).

BCP submitted modeling to demonstrate compliance with the MAAQS, NAAQS and PSD increments. The airborne concentrations of NO_x, CO, SO_2, VOCs, and PM_{10} were modeled.

The ISC3 model was used along with three years of on-site surface meteorological data (1994-1996) collected at the Rhodia facility and the same three years of upper air data collected at the Great Falls International Airport National Weather Station. In addition, one year of surface met data was collected at the nearby MSE (Mountain States Energy) Component Development and Integration Facility (CDIF). Trinity consultants, Inc., compiled a full year of surface data that was collected in 1988 by MSE personnel with Great Falls NWS upper air mixing height data and temperature and cloud cover data from the Bert Mooney Airport in Butte.

The receptor grid was generated from digital elevation model (DEM) files using the using 7.5-minute United States Geological Survey (USGS) topographical maps. Receptors were also placed in the PM_{10} non-attainment area and the nearest Class I areas.

The modeling was performed in accordance with the methodology outlined in the New Source Review Workshop Manual, EPA, October 1990 Draft, and Appendix W of 40 CFR 51, Guideline on Air Quality Models (revised), August 12, 1996.

As previously mentioned, modeling was conducted for PM_{10}, NO_x, CO, SO_2, and VOC emissions from BCP. All of the modeled concentrations were below the monitoring de minimis concentrations. Furthermore, all of the modeled pollutant concentrations were below the modeling significance levels except for PM_{10} and NO_x emissions. An ambient analysis was conducted for NO_x and VOC emissions from the nearby ASiMI, Montana Resources, MSE, and Continental Energy facilities. All of the modeled concentrations, except PM_{10}, were below the NAAQS/MAAQS as shown in Table 1. The PM_{10} emissions were addressed separately in the PM_{10} nonattainment analysis.

Table 1. Ambient Modeling Results

Pollutant	Avg. Period	Modeled Conc. ($\mu g/m^3$)	Background Conc. ($\mu g/m^3$)	Ambient Conc. ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	MAAQS ($\mu g/m^3$)	% NAAQS Consumed	% MAAQS Consumed
NO_2	1-hr	454.7[a]	75	529.7	------	564	-----	93.9
	Annual	67.6[b]	6	50.7	100	94	50.7	53.9
VOC (O_3)	1-hr	90.8	------	90.8	235	196	38.6	46.3

[a] Concentration calculated using the Ozone Limiting Method.
[b]Applying the Ambient Ratio Method with National Default of 75%– modeled concentration was 68.29 μg/m^3 .

At the Department's request, a Class I/Class II Prevention of Significant Deterioration (PSD) Increment Analysis was conducted for PM_{10} and NO_x emissions. The other non-BCP NO_x increment consuming sources in the analysis included ASiMI and Continental Energy. The other non-BCP PM_{10} sources included ASiMI, Continental Energy and the PM_{10} emissions from the Rhodia facility (only fugitive emissions from storage piles were included since the equipment as been removed from the Rhodia site). The Class II increment modeling results are shown in Table 2. All modeled concentrations are less than the Class II Increments.

Table 2. Class II Modeling Results

Pollutant	Avg. Period	Met Data Year	Class II Modeled Conc. (μg/m^3)	PSD Class II Increment (μg/m^3)	% PSD Class II Increment Consumed
PM_{10}	24-hr	1987	7.4	30	24.7
	Annual	1987	1.8	17	10.5
NO_x	Annual	1987	17.7	25	70.8

Additional modeling runs were conducted to determine the PM_{10} and NO_x impacts on the nearest Class I areas, including the Anaconda Pintler Wilderness (APW) and Yellowstone National Park (YNP). The Humbug Spires (not a Class I area) was also included in the increment analysis. The model runs consisted of the same sources included in the Class II increment Analysis. Table 4 summarizes the Class I PSD increment modeling results (which were all below applicable standards) and EPA's Proposed Class I Significance Levels (which are approximately 4% of the PSD Class I increments).

Table 3. Class I Modeling Results

Pollutant	Avg. Period	Met Data Year	Receptor Location	Class I Modeled Conc. (μg/m^3)	PSD Class I Increment (μg/m^3)	% PSD Class II Increment Consumed
PM_{10}	Annual	1994	Humbug Spires[a]	0.02	4	0.2
		1987	APW	0.01		
		1995	YNP	0.01		
	24-hr	1994	Humbug Spires[a]	0.27	8	1.7
		1987	APW	0.18		
		1995	YNP	0.06		
NO_x	Annual	1994	Humbug Spires[a]	0.07	2.5	0.4
		1987	APW	0.01		
		1995	YNP	0.02		

[a]Not a Class I area, but is a sensitive and popular recreational wilderness area near Butte.

As previously stated, BCP is located within the Butte PM_{10} nonattainment area. The model-predicted impacts for PM_{10} emissions are above the air quality significance levels. However, the maximum-modeled 24-hr and annual impacts at the PM_{10} monitoring station at the Greeley School in Butte are 0.012 μg/m^3 and 0.27 μg/m^3, respectively. Thus, the model-predicted 24-hr and annual impacts at this monitoring station are less than 0.01% and 0.5% of the respective air quality significance levels. Because the proposed facility will be located in the PM_{10} nonattainment area, the Department requested an update to the 1995 Chemical Mass Balance (CMB) analysis to show compliance with the PM_{10} NAAQS. Air dispersion modeling was conducted for Montana Resources, Rhodia, CES, and ASiMI. The modeling followed a three-step process to show that BCP would not contribute above 50 μg/m^3 to the CMB in order to demonstrate compliance with the NAAQS/MAAQS. The 24-hour CMB analysis could accommodate a 24-hr impact of up to 50 $\mu g/m^3$ and still remain below the NAAQS/MAAQS.

In the Significant impact analysis, the Department demonstrated that BCP was significant for both the annual and the 24-hour standard. Thus, **Step 1** consisted of conducting a significant impact analysis for all four years of meteorological (met) data. Results from step 1 showed that BCP had annual PM_{10} significant impacts from only the 1987 met data year with four receptors with significant impacts above 1 μg/m3. The four receptors were identified and used in step 2.

Step 2 consisted of modeling PM_{10} emissions from BCP, MRI, AsiMI, CES, and Rhodia. The receptor grid consisted of 25 receptors from Step 1 that had shown a significant impact from BCP. MAXI files were created to show all of the impacts that were above the modeling significance level of 5 $\mu g/m^3$.

Step 3 consisted of taking the MAXI files created in steps 1 and 2 and inputting these files into a program created by Bison Engineering, Inc. which matched the impacts that occurred at the same receptor location and on the same day. This program identified the largest cumulative 24-hr impact for which BCP had a significant contribution as 20.5 $\mu g/m^3$ and the highest annual impact for which BCP had a significant contribution as 6.96 $\mu g/m^3$.

In **Step 4**, the highest cumulative impacts identified in step 3 were included in the chemical mass balance (CMB) spreadsheet which examines the current impacts to the Butte nonattainment area (i.e., 2004) and impacts projected 10 years from the current date (i.e., 2014). A background concentration was calculated by adding the concentrations contributed by all sources in the CMB document except for MRI and Rhodia sources. These background concentrations (including area sources) were added to the maximum model-predicted 24-hr and annual concentrations, respectively. The resulting concentrations were then compared to the 24-hr and annual NAAQS/MAAQS. Table 5 summarizes the results of the CMB spreadsheet, which show that the concentrations do not exceed the annual or 24-hr PM_{10} NAAQS/MAAQS.

Table 5. PM_{10} Nonattainment Modeling Results

Pollutant	Averaging Period	Predicted Concentrations + Background ($\mu g/m^3$)		NAAQS/MAAQS ($\mu g/m^3$)
		2004	2014	
PM_{10}	Annual	31.7	32.6	50
PM_{10}	24-hour	105.9	110.0	150

The modeling submitted in support of Permit Application #3211-02 shows compliance with the ambient standards, PSD increments, and Butte/Silver Bow State Implementation Plan.

VI. Taking or Damaging Implication Analysis

As required by 2-10-101 through 105, MCA, the Department conducted a private property taking and damaging assessment and determined there are no taking or damaging implications.

VII. Environmental Assessment

An environmental assessment, required by the Montana Environmental Policy Act, was completed for this permitting action. A copy is attached.

DEPARTMENT OF ENVIRONMENTAL QUALITY
Permitting and Compliance Division
Air Resources Management Bureau
P.O. Box 200901, Helena, Montana 59620
(406) 444-3490

FINAL ENVIRONMENTAL ASSESSMENT (EA)

Issued To: Basin Creek Power Services, LLC
65 East Broadway
Butte, MT 59701

Air Quality Permit Number: #3211-02

Preliminary Determination Issued: 04/02/04
Department Decision Issued: 04/20/04
Permit Final: 05/06/04

1. *Legal Description of Site*: The BCP electric power plant would be located in the Butte Industrial Park area in Butte, Montana. The legal description of the site would be Section 18, Township 2 North, Range 7 West, in Silver Bow County. Overall, the BCP property area would consist of approximately 20 acres with the power plant facility covering approximately 10 acres.

2. *Description of Project*: The current permit action would allow the replacement of the three previously permitted (Permit #3211-01) 16.1 MW lean-burn RICE rated at a combined capacity of 48.3 MW with nine 6.1 MW RICE with a combined capacity of 54.9 MW. Although the combined capacity of the project would increases by approximately 6.5 MW, the emissions would remain the same or decrease. NO_x and VOC emissions would remain relatively the same, while PM/PM_{10}, CO, and SO_2 emissions all decrease. SO_2 emissions would decrease by approximately 21.5 tons with the elimination of the #2 fuel oil used in Permit #3211-01.

   Permit #3211-02 would include federally enforceable permit conditions to limit the NO_x emissions from the facility. Facility-wide potential NO_x emissions would be limited to a level less than the NSR/PSD permitting threshold of 250 tons per year per pollutant. The method for achieving this limit would be established as a combined RICE operating limit of 34,200 hours during any rolling 12-month time period and fuel specific limits.

3. *Objectives of Project*: The objective of the project would be for BCP to establish a nominal 54.9-MW natural gas-fired power plant to generate electricity for customers in Montana and other potential clients.

4. *Alternatives Considered*: In addition to the proposed action, the Department considered the "no action" alternative. Under the "no action" alternative, the Department would deny the air quality preconstruction permit for the proposed facility and none of the impacts discussed in this EA would occur. However, BCP demonstrated that operations would comply with all applicable rules required for permit issuance. Therefore, the Department eliminated the “no action” alternative from further consideration.

5. *A Listing of Mitigation, Stipulations, and Other Controls*: A list of enforceable conditions, including a BACT analysis, would be included in Permit #3211-02.

6. *Regulatory Effects on Private Property*: The Department considered alternatives to the conditions imposed in this permit as part of the permit development. The Department determined that the permit conditions would be reasonably necessary to ensure compliance with applicable requirements and demonstrate compliance with those requirements and would not unduly restrict private property rights.

7. The following table summarizes the potential physical and biological effects of the proposed project on the human environment. The "no action" alternative was discussed previously.

Potential Physical and Biological Effects							
		Major	Moderate	Minor	None	Unknown	Comments Included
A.	Terrestrial and Aquatic Life and Habitats			X			yes
B.	Water Quality, Quantity, and Distribution			X			yes
C.	Geology and Soil Quality, Stability, and Moisture			X			yes
D.	Vegetation Cover, Quantity, and Quality			X			yes
E	Aesthetics			X			yes
F.	Air Quality			X			yes
G.	Unique Endangered, Fragile, or Limited Environmental Resource				X		yes
H.	Demands on Environmental Resource of Water, Air, and Energy			X			yes
I.	Historical and Archaeological Sites				X		yes
J.	Cumulative and Secondary Impacts			X			yes

SUMMARY OF COMMENTS ON POTENTIAL PHYSICAL AND BIOLOGICAL EFFECTS: The following comments have been prepared by the Department.

A. Terrestrial and Aquatic Life and Habitats

Terrestrials such as livestock, deer, and rodents would use the general area near the facility. The area surrounding the facility would be fenced to limit access to the site; however, the fencing would likely not restrict access from all animals that frequent the area, but would likely discourage most animals from entering the facility property. Impacts from the construction and operation of the electric generation facility to terrestrial and aquatic life and habitats would be minor because of the relatively small portion of land (approximately 10 acres) that would be disturbed and the minor impact to the surrounding area from the air emissions, considering the area air dispersion characteristics (see Section 7.F of this EA and Section V of the permit analysis).

The facility would be located in the Butte Industrial Park area; thus, the surrounding area is currently used for business, agriculture, recreation, ranching, livestock grazing, and industrial research. Therefore, the BCP facility would not change the overall character of the area and impacts to terrestrial and aquatic life and habits would be minor and consistent with current impacts. Other local industrial sources, such as Montana Resources, Inc. (MRI), Advanced Silicon Materials, Inc. (ASiMI), and Continental Energy Services (CES) are located within approximately 10 miles of the BCP property boundary. Mountain States Energy Technology Applications, Inc. (MSE) is located adjacent to the proposed facility location and specializes in development and testing of new technologies.

Aquatic life and habitats would realize little or no impact from the proposed facility because BCP is not proposing to directly discharge effluent to any surface water or ground water in the area. Further, the air emissions analysis indicates that any impacts from the BCP emissions on land or surface water would be minor and would consume only a small portion of the ambient air quality standards (see Section 7.F of this EA and Section V of the permit analysis). The small amount of air impact would correspond to an equally small amount of deposition on local resources, including areas inhabited by terrestrial and aquatic life.

Annexation of the sewer, water, and natural gas portion of this project would result in minor impactS on the terrestrial and aquatic life and habitats because the activities would result in minimal disturbance to land and water and the disturbances would be temporary in those areas that are not already disturbed. The sewer and water system and natural gas pipeline connection would require the use of motor vehicles and other equipment, but again, the impacts would be minor and of a short time duration.

B. Water Quality, Quantity, and Distribution

Overall, the proposed power generation facility would result in minor impacts to water quality, quantity, and distribution in the area because little or no impacts to the surrounding area would result from the air emissions. As described in Section 7.F of this EA and Section V of the permit analysis, the maximum impacts from the air emissions from this facility would be minor. As a result of the relatively low air quality impact from this facility, the corresponding deposition of the air pollutants in the area would also be minor. Based on the local dispersion characteristics such as wind speed, wind direction, atmospheric stability, facility stack temperature(s), etc., the highest impacts would not occur at or near any major water body.

In addition, facility water demands would be relatively low and, as part of the project, the facility would likely be connected into the existing Butte/Silver Bow City water supply and sewage discharge system. Thus, all water for the facility would likely be obtained from the Butte/Silver Bow municipal water supply, and all spent water would be discharged to the Butte/Silver Bow sewer system. Thus, any impacts resulting from the water demands for the proposed facility would be relatively minor. Overall, any impacts to water quality, quantity, and distribution would be minor.

C. Geology and Soil Quality, Stability, and Moisture

Impacts to the area's geology and soil quality, stability, and moisture from this facility would be minor because the project would impact a relatively small portion of land and the amount of resulting deposition of the air emissions would be minor (see Section 7.F of this EA and Section V of the permit analysis). Approximately 10 acres would be disturbed for the physical construction of the power plant. Soil stability in the immediate vicinity would likely be impacted by the new footings and foundations required for the facility. The major construction required would be from equipment installation and various housing that would be required for the RICE. The facility processes would not be discharging any material directly to the soil of the immediate area. A portion of the air emissions from the facility may deposit on local soils; however, that deposition would result in only a minor impact to local surroundings because of the air dispersion characteristics of the area and the emitting units (See Section 7.F of this EA and Section V of the permit analysis).

The city annexation (sewer and water) and natural gas pipeline connection portions of this project would result in very little impact on the geology and soil quality, stability, and moisture of the area because the activities would result in minimal disturbance to these resources and the disturbances would be temporary in those areas that have not already been disturbed. The sewer and water system or other infrastructure upgrades would require the use of various types of motor vehicles and supplies; however, the impacts would be minor and of a short time duration. Overall, any impact to area geology and soil quality, stability, and moisture would be minor.

D. Vegetation Cover, Quantity, and Quality

Minor impacts would result on the vegetation cover, quantity, and quality in the immediate area of the proposed project because a small amount of property would be physically disturbed (approximately 10 acres). In addition, the modeled air impacts demonstrate that air emissions from this facility would be minor and the resulting deposition from air emissions on any vegetation cover would be relatively small (see Section 7.F of this EA and Section V of the permit analysis). The main physical disturbance would be from the construction and housing required for the RICE and other ancillary equipment. However, the construction and operation of the facility would only impact approximately 10 acres of land. In comparison to the surrounding industrial, agricultural, and grazing properties, the proposed land disturbance would constitute a relatively small percentage of the overall disturbance in the area and thus only a small disturbance to existing vegetation cover in the area (See Section 8.D of this EA).

The annexation of the project would have little, if any, impact on the vegetation cover, quantity, and quality in the area because the disturbances would occur primarily on small portions of previously disturbed terrain. Those disturbances to previously disturbed land would be of short duration and the land would eventually be returned to its previous status. Of those impacts to previously undisturbed areas, the amount of vegetation disturbed would be minor given the relatively small amount of land to be disturbed. Overall, any disturbance to area vegetation cover, quantity, and quality would be minor.

E. Aesthetics

Impacts to the aesthetics of the area from this project would be minor because the proposed facility would be relatively small when compared to other existing industrial and commercial facilities/structures located in the nearby area. Given the relatively small size of the facility, visual impacts would be minor and the noise from the facility would be minor and consistent with the current noise levels in the area. The general facility design would consist of structures to house and protect the RICE and emissions from the RICE would exhaust through separate stacks that would stand approximately 74 feet above the ground surface.

The BCP facility may be partially visible from various locations in the general area, including Basin Creek Road, located approximately 3/4 mile to the east, a residential area approximately 1 mile to the north, and sporadic residential housing to the west and south. Other existing and visible structures and equipment in the area include industrial storage tanks, stacks, buildings, various businesses, electrical power poles, electric power lines, and electric power substations. Therefore, based on the current visibility of existing structures adjacent to and near the proposed plant, any visual impact from the proposed BCP facility would be minor.

The area would also receive increased vehicle traffic as a result of the proposed project; however, the amount of vehicle trips in the area would not increase substantially over the existing traffic in the primarily industrial/agricultural area. Vehicles would use the existing roads in the area en route to the roads established as part of the actual facility. Visible emissions (whether the county's responsibility or BCP's responsibility) would be limited to 20% opacity. Likewise, increases in area odors from the facility would be minor because odors from the combustion of natural gas would be negligible and would be only slightly perceptible, if at all. Overall, any aesthetic impacts would be minor.

F. Air Quality

The Clean Air Act, which was last amended in 1990, requires EPA to set NAAQS for pollutants considered harmful to public health and the environment. These pollutants are known as Criteria Pollutants and consist of: CO, NO_x, Ozone, Lead, PM_{10}, and SO_2. The Clean Air Act established two types of NAAQS, Primary and Secondary. Primary Standards are limits set to protect public health, including, but not limited to, the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary Standards are limits set to protect public welfare, including, but not limited to, protection against decreased visibility, damage to animals, crops, vegetation, and buildings. Primary and Secondary Standards are identical with the exception of SO_2 which has a less stringent Secondary Standard. The air quality classification for Butte is "Unclassifiable or Better than National Standards" (40 CFR 81.327) for all pollutants except PM_{10}, as described in Section V of the permit analysis.

The maximum estimated emissions from the facility are approximately 248.2 tpy of NO_x, 88.8 tpy of CO, 20.0 tpy of PM_{10}, 44.6 tpy VOC, and 0.5 tpy of SO_2. The pollution control devices proposed for each engine are catalytic oxidizers for control of CO and VOC emissions. There is no add-on controls proposed for NO_x, PM_{10} and SO_2 emissions since BACT did not drive control requirements (see Section IV, BACT Analysis, of the permit analysis to this permit for a detailed discussion of controls).

BCP submitted modeling to demonstrate compliance with the MAAQS, NAAQS, and PSD increments. The airborne concentrations of NO_x, CO, SO_2, VOCs, and PM_{10} were modeled. The ISC3 model was used along with three years of on-site surface meteorological data (1994-1996) collected at the Rhodia facility and the same three years of upper air data collected at the Great Falls International Airport National Weather Station. In addition, one year of surface met data was collected at the nearby MSE (Mountain States Energy) Component Development and Integration Facility (CDIF). Trinity consultants, Inc., compiled a full year of surface data that was collected in 1988 by MSE personnel with Great Falls NWS upper air mixing height data and temperature and cloud cover data from the Bert Mooney Airport in Butte.

The receptor grid was generated from digital elevation model (DEM) files using the using 7.5-minute United States Geological Survey (USGS) topographical maps. Receptors were also placed in the PM_{10} non-attainment area and the nearest PSD Class I areas.

The modeling was performed in accordance with the methodology outlined in the New Source Review Workshop Manual, EPA, October 1990 Draft, and Appendix W of 40 CFR 51, Guideline on Air Quality Models (revised), August 12, 1996. A complete description of the modeling is contained in Section V of the Permit Analysis. The modeling submitted in support of Permit Application #3211-02 shows compliance with all applicable ambient

standards and the PSD increments that were analyzed. Therefore, any impacts to the air quality of the proposed area of operation would be minor.
Furthermore, carbon dioxide (CO_2) will be emitted from the proposed RICE. CO_2 is not a regulated pollutant; however, because BCP is sensitive to the concern surrounding greenhouse gas emissions, BCP has quantified the potential CO_2 emissions. The CO_2 emissions will be partially offset per an agreement between BCP and Montana Environmental Information Council (MEIC).

G. Unique, Endangered, Fragile, or Limited Environmental Resources

To identify any species of special concern in the immediate area of the proposed project, the Department contacted the Montana Natural Heritage Program of the Natural Resource Information System (NRIS). The Natural Heritage Program files found no records of species of special concern in the 1-mile buffer area surrounding the Section, Township, and Range of the proposed facility. Further, based on the modeled air quality impacts from the BCP facility, the proposed facility would have little, if any impact on any unique endangered, fragile, or limited environmental resources in the area that have not been recorded by NRIS. The air dispersion modeling analysis results indicate that the worst-case impacts from the air emissions from this facility would be minor (see Section 7.F of this EA and Section V of the permit analysis). No impacts to unique endangered, fragile or limited environmental resources would be expected given the lack of any of these resources present in the area.

H. Demands on Environmental Resources of Water, Air, and Energy

As described in Section 7.B of this EA, impacts to any area water resources would be minor because the demands for water would be relatively low and the resulting amount of wastewater generated would be small. Furthermore, BCP is not proposing to directly discharge any material to surface or ground water resources in the area. Any wastewater produced would be sent to the Butte/Silver Bow sewer system. In addition, as described in Section 7.F of this EA, any impact to the air resource in the area of the facility would be minor because the air emissions from the facility would be relatively low and the dispersion characteristics of the facility and local area would be good. Ambient air modeling for NO_x, CO, VOC, PM, PM_{10}, and SO_2 was conducted for the facility at "worst case" conditions. The modeling demonstrates that the emissions from the proposed facility would not exceed any ambient air quality standard nor significantly contribute to the PM_{10} nonattainment area (see Section 7.F of this EA and Section V of the permit analysis). As a result of the ambient air quality analysis summarized in Section 7.F of the EA and Section V of the permit analysis, Permit #3211-02 would contain conditions limiting the emissions from the facility.

Impacts to the energy resource from this facility would be minor because the facility would consume relatively small amounts of natural gas. The facility would also produce relatively small amounts of electric power (approximately 48 MW) in comparison to the electric power that is produced throughout Montana and the United States.

The annexation of the sewer, water, and natural gas portion of this project would result in very little air quality impact because no major air emission activities would be required. The sewer and water system and natural gas transmission upgrade may require the use of motor vehicles, but the impacts would be minor and of a short time duration. Similarly, temporary and minor fugitive dust emissions would result from the sewer and water system and natural gas pipeline upgrades. Overall, any demands for environmental resources of water, air, and energy would be minor.

I. Historical and Archaeological Sites

Impacts on historical and archaeological sites would be minor at this location because the site contains no visible standing structures, the facility would physically impact a very small amount of property (approximately 10 acres), and the site location is in an area that would not have been likely used for any significant historical or archaeological activity. The lack of standing structures indicates a low potential of any significant historical activity within the proposed site location.

The Department contacted the Montana Historical Society - State Historic Preservation Office (SHPO) in an effort to identify any historical, archaeological, or paleontological sites or findings near the proposed project. SHPO records indicate that there are currently no previously recorded cultural properties within the project site. Because agricultural and ranching activities have occurred in the area, the likelihood of finding undiscovered or unrecorded historical properties is very low.

The city annexation (sewer and water) portion of this project would not likely result in any impact to historical or archaeological sites because the disturbances would generally occur within previously disturbed sites, and the sites that are not previously disturbed would be in the same general area as previously described in this section.

J. Cumulative and Secondary Impacts

Overall, the cumulative and secondary impacts from this project on the physical and biological aspects of the human environment would be minor because the proposed impacts would be minor. The proposed BCP facility would be located in relative close proximity to power lines and a natural gas distribution pipeline. Because the connections to electrical lines and the construction of gas and water pipelines creates minimal disturbance to the environment and the disturbances would be temporary, any impact would be minor.

Based on modeling, using the "worst case" potential air emissions and the other non-BCP emission sources (i.e., MSE, MRI, ASiMI, and CES), the NAAQS/MAAQS for PM, PM_{10}, NO_x, SO_2, and VOC would not be exceeded for this project. In addition, the highest impact from each of the other nearby industrial sources would not occur at the same receptor, and the pollutants of concern for each of the other area industries are variable. The Class I and Class II Area modeling analysis also indicated that the PSD increments would not be exceeded for NO_x or PM_{10}. The NO_x and PM_{10} Class I PSD Increment modeling analysis was conducted for the nearest Class I areas including APW and YNP. Although not a Class I area, the Humbug Spires recreational area was also included in the Class I increment analysis. Finally, because the proposed facility would be located in the Butte PM_{10} nonattainment area, the Department requested an update to the 1995 Chemical Mass Balance (CMB) Analysis to show compliance with the PM_{10} NAAQS. Air dispersion modeling for the CMB analysis included other industrial sources such as MRI, Rhodia, CES, and ASiMI. The PM_{10} modeling results showed that emissions from the addition of the BCP facility (along with the other local sources) would comply with annual and 24-hour PM_{10} NAAQS/MAAQS. Overall, any potential cumulative and secondary impacts resulting from the proposed BCP project would be minor.

8. The following table summarizes the potential social and economic effects of the proposed project on the human environment. The "no action" alternative was discussed previously.

Potential Social and Economic Effects							
		Major	Moderate	Minor	None	Unknown	Comments Included
A.	Social Structures and Mores				X		yes
B.	Cultural Uniqueness and Diversity				X		yes
C.	Local and State Tax Base and Tax Revenue			X			yes
D.	Agricultural or Industrial Production			X			yes
E.	Human Health			X			yes
F.	Access to and Quality of Recreational and Wilderness Activities			X			yes
G.	Quantity and Distribution of Employment			X			yes
H.	Distribution of Population				X		yes
I.	Demands for Government Services			X			yes
J.	Industrial and Commercial Activity			X			yes
K.	Locally Adopted Environmental Plans and Goals				X		yes
L.	Cumulative and Secondary Impacts			X			yes

SUMMARY OF COMMENTS ON POTENTIAL SOCIAL AND ECONOMIC EFFECTS: The following comments have been prepared by the Department.

A. Social Structures and Mores

The BCP facility would be located in the Butte Industrial Park area; therefore, the proposed facility would not cause a disruption to any native or traditional lifestyles or communities (social structures or mores) in the area because the proposed land use for this facility would be consistent with existing land uses in the area. Land in the adjacent area would continue to be used for industrial, farming, ranching, and various business activities.

The other portion of the project (annexation of the facility) would have no impact on social structures and mores because these associated activities are consistent with activities performed throughout Montana and specifically within the proposed area of operation. Most of the impacts would occur within previously disturbed areas or in areas with other required improvements or upgrades.

B. Cultural Uniqueness and Diversity

The proposed project would not impact the cultural uniqueness and diversity of the area because the area is currently used for a variety of activities including farming, ranching, and industry. With the addition of BCP to the area, the area would maintain these types of facilities/operations.
The other portion of the project (annexation of the facility) would have no impact on cultural

uniqueness and diversity because the land use of the area would not change as a result of the proposed project. Overall, the surrounding area would remain unchanged as a result of the proposed project; therefore, cultural norms would remain and the diversity of population would not change.

C. Local and State Tax Base and Tax Revenue

The BCP project would be privately funded. The facility would have a minor effect on the local and state tax base and tax revenue because it would generate state and local taxes and would employ a number of people during construction and approximately 10 people after completion of the project. Overall, any impact to the local and state tax base and tax revenue would be minor.

D. Agricultural or Industrial Production

Impacts from the operation of this facility on agricultural and industrial production in the area would be minor because the facility would impact only a small amount of land (approximately 10 acres), the impact from the air emissions on the land would be small, and the amount of electricity produced to assist other industrial activities within the state would be relatively small when compared to existing Montana electric utilities. This facility would be located adjacent to the MSE research and testing facility and the immediate area surrounding the facility would be fenced (approximately 10 acres). Only the area within the fenced acres would be physically impacted and those impacts would be minor. As described in Section 7.F of the EA and Section V of the permit analysis, the air quality impacts from this facility would be minor and the resulting deposition of the pollutants from the BCP project would be similarly minor. In addition, as described in Section 7.F of this EA and Section V of the permit analysis, the facility would comply with the NAAQS and MAAQS (protect public health and promote public welfare), which indicates impacts from the facility would be minor. The BCP facility may assist other industrial production because the electric power generated from the facility would be available to customers in Montana; however, as previously described, when compared to existing electric utilities in Montana, the amount of new power available to industrial sources would be relatively small.

City annexation of the facility sewer and water system would have little, if any, impact on agricultural or industrial production because the disturbance for most of the activities would be within previously disturbed locations and disturbances at other locations (addition of utilities during annexation) would be minor, temporary, and would not change the overall setting of the area.

E. Human Health

Any impacts from this facility on human health would be minor because air emissions would be greatly dispersed prior to potential exposure to humans. Also, as described in Section 7.F of the EA and Section V of the permit analysis, the modeled impacts from this facility, taking into account other dispersion characteristics (i.e., wind speed, wind direction, atmospheric stability, stack height, stack temperature) would be low and would maintain compliance with the MAAQS and NAAQS. The air quality permit for this facility would incorporate conditions to ensure that the facility would be operated in compliance with all applicable air quality rules and standards. These rules and standards are designed to be protective of human health. Besides the criteria pollutants, the impacts from all other air pollutants (CO_2 and HAPs) would be minimized by the dispersion characteristics of the facility and the area (i.e., wind speed, wind direction, atmospheric stability, stack temperature, facility emissions).

Overall, any impacts to human health would be minor.

F. Access to and Quality of Recreational and Wilderness Activities

The proposed facility would result in minor, if any, impacts to access and quality of recreational and wilderness activities because of the industrial location and relatively small size of the facility. In addition, air emissions from the facility would be relatively minor and would disperse before impacting the recreational areas (see Section 7.F of this EA and Section V of the permit analysis). Recreational opportunities in the general area would include, but are not limited to, Homestake Lake (approximately 7 miles), Delmoe Lake (approximately 9 miles), Humbug Spires (approximately 10 miles), Thompson Park (approximately 3 miles), Burton Park (approximately 7 miles), Stodden Park (approximately 3 miles), YMCA (approximately 1.5 miles), Margaret Leary School (approximately 2 miles), and Moulton Reservoir recreational area (approximately 11 miles). Based on the modeling analysis performed for the BCP project (see Section 7.F of this EA and Section V of the permit analysis), any impacts to the previously mentioned recreational opportunities and activities in the area would be minor.

The sewer and water system annexation of the facility would have no impact on recreational and wilderness activities because the areas of potential disturbance are currently not used for these types of activities and because most of the impacts would be temporary. Overall, any impact to access and the quality of recreational and wilderness activities in the proposed area would be minor.

G. Quantity and Distribution of Employment

The proposed project would result in minor impact to existing employment of the area because the project would result in numerous construction-related employment opportunities and a few (approximately 10) subsequent full-time positions. The construction of the facility would likely be a top priority for BCP; therefore, BCP would likely work extended hours to construct the facility as soon as possible. BCP estimates that approximately 75 employees would be needed during peak construction of the facility. When feasible and economical, BCP plans on using local contractors and workers for construction and operation. Although the feasibility would be dependent on availability and qualifications, BCP contends that the lowest cost contractors would have the best chance of being utilized.

A few temporary employment opportunities would result from various other portions of the project. The sewer and water system annexation and utility and natural gas transmission line work would require construction and corresponding employment. However, the impacts on quantity and distribution of employment would be minor because any required work for these aspects of the project would be temporary. Overall, any impact to the quantity and distribution of employment in the proposed area would be minor.

H. Distribution of Population

The proposed project would result in minor impacts to the normal population distribution in the area because the majority of jobs resulting from the project would be temporary and likely filled by local workers. Further, approximately 10 full-time positions would result from the project; however, the potential addition of 10 new employees to the area would have little impact to the area considering the existing Butte population base. For the other construction-related activities associated with this project (city annexation), the employees would also likely be from the area. Overall, any impact to the distribution of population in the Butte area would be minor.

I. Demands of Government Services

Demands on government services from this facility would be minor because minor increases may be seen in traffic on existing roads in the area while the facility is operating. However, since the facility would be annexed into existing county systems as part of the project, other miscellaneous improvements may be required. All water for the facility would likely be obtained from the Butte Silver Bow municipal water supply, and all spent water would be discharged to the Butte Silver Bow sewer.

In addition, the acquisition of the appropriate permits by the facility, the permits for the associated activities of the project, and compliance verification with those permits would also require minor services from the government.

J. Industrial and Commercial Activity

Overall, the BCP facility would represent a minor increase in industrial and commercial activity in the area. The facility would potentially operate 24 hours a day and 7 days per week generating electricity in full or partial capacity. Further, the construction activities associated with the facility would result in temporary increases in the commercial activity in the area. The facility would be located in the Butte Industrial Park, which would be consistent with current and previous surrounding activities.

In addition, the production of electrical power may result in additional industrial activity due to the availability of local power. However, as previously cited, the electrical production capacity from the proposed facility is relatively minor when compared to existing Montana utilities. Overall, any impact to local industrial and commercial activity would be minor.

K. Locally Adopted Environmental Plans and Goals

The air quality classification for the area of the proposed facility is "Nonattainment for PM_{10}." The proposed facility would seldom operate during "worst case" emission conditions identified by the manufacturers data. However, using BCP "worst case" emissions and emissions from non-BCP sources, the CMB Analysis demonstrated compliance with PM_{10} MAAQS/NAAQS and the Butte/Silver Bow State Implementation Plan (SIP). In addition, Class I and Class II PSD increment analysis for PM_{10} predicted concentrations would be well below the PM_{10} PSD increment levels. The CMB analysis for the area sources (including BCP) predicted that PM_{10} concentrations would be below the MAAQS/NAAQS (see Section 7.F of this EA and Section V of the permit analysis). The Department is unaware of any other locally adopted environmental plans and goals that would be affected by the facility or other portions of the project as identified in this EA.

L. Cumulative and Secondary Impacts

Overall, the cumulative and secondary impacts from this project on the social and economic aspects of the human environment would be minor because some new full-time employment opportunities may result, temporary construction related employment opportunities would be available, state and local taxes would be generated, and the facility could sell power to other residents and industries in Montana. Overall, the BCP project would result in additional jobs for the Butte area. As described in Section 8.G of this EA, the facility would employ approximately 10 full-time people and approximately 75 people during the peak construction phase. The possible "day-to-day" normal operation positions and the construction-related positions created by the BCP project would bring additional revenue into the Butte economy. Overall, any cumulative and secondary impacts resulting from the proposed project would be minor.

Recommendation: No EIS is required.

IF an EIS is not required, explain why the EA is an appropriate level of analysis: The current permitting action is for the construction and operation of a natural gas-fired electric power generating facility. Permit #3211-02 would include conditions and limitations to ensure the facility would operate in compliance with all applicable air quality rules. In addition, there are no significant impacts associated with this proposal.

Other groups or agencies contacted or that may have overlapping jurisdiction: Montana Historical Society - State Historic Preservation Office, Natural Resource Information System - Montana Natural Heritage Program.

Individuals or groups contributing to this EA: Department of Environmental Quality (Air Resources Management Bureau, Mine Waste Cleanup Bureau, Resource Protection Planning Bureau, and Environmental Management Bureau); Montana Historical Society – State Historic Preservation Office; Natural Resource Information System - Montana Natural Heritage Program.

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